

Remarks

Reconsideration of this Application is respectfully requested.

Upon entry of the foregoing amendments, claims 1, 3-5, and 7-16 are pending in the application, with claims 1, 5 and 9 being the independent claims. Claims 1, 4, 5, 8-10, and 13 are sought to be amended. New claims 14-16 are sought to be added. These changes are believed to introduce no new matter, and their entry is respectfully requested.

Based on the above amendment and the following remarks, Applicant respectfully requests that the Examiner reconsider all outstanding objections and rejections and that they be withdrawn.

Applicant would like to thank the Examiner for the personal interview on February 8, 2006, which included: Examiner Agustin Bello; Applicant, Dr. Christopher Davis; and Applicant's representatives, Michael Messinger, Reg. No. 37,575, and Jonathan Tuminaro. During the interview, Applicant and Applicant's representatives pointed out differences between the primary applied reference (U.S. Patent No. 6,278,537 to Miyamori) and the claimed invention. The Examiner suggested claim language that would further distinguish the claimed invention from the primary applied reference. An agreement was not reached. Arguments made during the interview are incorporated and expanded upon herein.

Rejections under 35 U.S.C. § 112

The Examiner has rejected claim 10 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. In particular, the Examiner asserts that there is insufficient antecedent basis for the limitation “the optical characteristic” as recited in line 5 of claim 10. Based on the foregoing amendments, the limitation “the optical characteristic” has been removed from claim 10. Hence, Applicant requests that the Examiner’s rejection of claim 10 under 35 U.S.C. § 112, second paragraph, be reconsidered and withdrawn.

Rejections under 35 U.S.C. § 103

The Examiner has rejected claims 1, 3-5, 7-9 and 11-13 under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,278,537 to Miyamori (“Miyamori”) in view of U.S. Patent No. 6,043,918 to Bozzay (“Bozzay”). Based on the following comments, Applicant respectfully traverses.

Miyamori is directed to a light-signal transfer system, including a transmitter and receiver, that is capable of reproducing data signals even if the transfer passage is temporally intercepted by an object. *See*, Miyamori at the Abstract. The transmitter includes a delay memory, a multiplexer, an error correction circuit, and an encoding circuit. *See, e.g.*, Miyamori at the Abstract; FIG. 3 of Miyamori; and Miyamori, column 5, lines 3-25. The delay memory delays a data signal by a predetermined amount. The multiplexer multiplexes the delayed data signal with the original data signal. *See, e.g.*, Miyamori, column 6, lines 49-67 through column 7, lines 1-6. The error correction

circuit and encoding circuit function to impart the digital signal with additional code, and to interleave the digital signal into block units. A modulator circuit modulates the digital signal and the information contained therein is transmitted to a receiver. Miyamori teaches that the method for modulating the digital signal can be Differential Quadrature Phase Shift Keying (DQPSK).

As currently amended, claim 1 recites a method for optical wireless communication, including the steps of:

- receiving a source data signal having data;
- creating a set of temporally distinguishable transmission signals, the temporally distinguishable transmission signals being temporally separated from each other, such that a first temporally distinguishable transmission signal is temporally distinguished from a second temporally distinguishable transmission signal by a time-delay;
- converting the set of temporally distinguishable transmission signals to obtain a corresponding set of temporally and optically distinguishable light signals optically distinguished based on at least one of wavelength and polarization, each light signal having a modulation representation of the data from the source data signal; and
- transmitting the set of temporally and optically distinguishable light signals in a single output transmission beam through the Earth's atmosphere, wherein a duration of the time-delay is set based on characteristics of atmospheric turbulence to reduce bit errors in the transmitted temporally and optically distinguishable light signals.

Miyamori does not teach each and every limitation of claim 1. For example, Miyamori does not teach “optically distinguishable light signals optically distinguished based on at least one of wavelength and polarization” as recited in claim 1. As mentioned above, Miyamori teaches the use of DQPSK to modulate the digital signal. In a DQPSK modulation scheme, unique patterns of binary bits are assigned to different *phases* of the modulated digital signal. In other words, Miyamori is silent with respect to

optically distinguishing light signals “based on at least one of wavelength and polarization.”

The shortcomings of Miyamori are not remedied by the teachings of Bozzay. As an initial matter, Bozzay is silent with respect to optically distinguishing light signals “based on at least one of wavelength and polarization,” as recited in claim 1. In addition, the combination of Miyamori and Bozzay does not support a *prima facie* case of obviousness against claim 1 because there is no motivation to combine Miyamori with Bozzay. In particular, as explained in detail below, modifying Miyamori’s light-signal transfer system to incorporate the time delay taught by Bozzay (as the Examiner suggests) would render Miyamori’s light-signal transfer system unsatisfactory for its intended purpose. *See In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); MPEP § 2143.01.

In Miyamori’s light-signal transfer system, a time delay is used to correct for instances in which a signal is “temporarily intercepted by a moving human being or the like.” *See, e.g.*, Miyamori, column 7, lines 49-51. According to Miyamori, the duration of the time delay must be longer than the period of interception of the transfer passage for the light-signal transfer system to achieve its intended purpose. *See, e.g.*, Miyamori, column 8, lines 19-24. Although Miyamori does not offer a numerical duration for this time delay, a person skilled in the art would reasonably expect a period of interception caused by a human being to be approximately 0.1 seconds or longer. Accordingly, a person skilled in the art would reasonably expect the time delay to be longer than at least approximately 0.1 seconds in order for Miyamori’s light-signal transfer system to satisfy its intended purpose.

A time delay taught by Bozzay is on the order of 0.0001 seconds. *See* Bozzay col. 2, lines 6-7). This means the time delay taught by Bozzay is approximately three orders of magnitude (*i.e.*, approximately 1000 times) *shorter* than the period of interception — not *longer* as required by express teachings of Miyamori. As a result, modifying Miyamori's light transfer system to incorporate the time delay taught by Bozzay would render Miyamori's light transfer system unsatisfactory for its intended purpose.

In sum, Miyamori and Bozzay alone or in combination do not teach or suggest each and every feature of claim 1. In addition, there is no motivation to combine Miyamori and Bozzay. Consequently, Miyamori and Bozzay do not support a *prima facie* case of obviousness as to claim 1. Claims 5 and 9 respectively recite a system and apparatus for optical wireless communication, wherein light signals are optically distinguished "based on at least one of wavelength and polarization." Accordingly, Miyamori and Bozzay do not support a *prima facie* case of obviousness as to claims 5 and 9 for at least the same reasons as set forth above with respect to claim 1. Therefore, Applicant respectfully requests that the Examiner's rejection of claims 1, 5 and 9 be reconsidered and withdrawn.

Claims 3 and 12 depend from claim 1, claims 7 and 13 depend from claim 5, and claim 11 depends from claim 9, and therefore respectively contain each and every feature of claims 1, 5 and 9. Consequently, Miyamori and Bozzay do not support a *prima facie* case of obviousness as to claims 3, 7, and 12-13 for at least the same reasons as set forth above with respect to claims 1, 5 and 9. Accordingly, Applicant respectfully requests that the Examiner's rejection of claims 3, 7, and 12-13 be reconsidered and withdrawn.

Claims 4 and 8 also depend from claims 1 and 5, respectively. Accordingly, claims 4 and 8 are patentable over Miyamori and Bozzay for at least the same reasons as claims 1 and 5, in addition to their own features. For example, as currently amended claims 4 and 8 each recite, *inter alia*, the following feature: “logically combining each successive bit in the first temporally adjusted temporally distinguishable data signal with a corresponding successive bit in the second temporally distinguishable data signal to obtain each successive output bit in a single output data signal.” Neither Miyamori nor Bozzay teach or suggest this feature.

To point out how the claim language distinguishes Miyamori, it is necessary to make a short digression concerning the workings of the receiver taught by Miyamori. The receiver includes a light receiving circuit, a demodulator circuit, a decoding circuit, an error correction circuit, a demultiplexer, a delay memory, and a data selector. *See*, Miyamori at FIG. 3. The light receiving circuit receives a light signal transmitted by the transmitter. The demodulator circuit demodulates the received light signal. The decoding circuit decodes and de-interleaves the signal in accordance with the encoding scheme employed by the encoder (which was described above). The error correction circuit attempts to correct errors in the signal caused during transmission. The demultiplexer separates the signal into two separate signals, one of which is time adjusted by the delay memory, resulting in a first and second data signal. The data selector receives three signals: (1) the first data signal, (2) the second data signal, and (3) an error correction signal from the error correction circuit. Based on the level of the error correction signal, the data selector selects either the first data signal or the second data signal as an output signal.

The manner in which an output signal is obtained in the light transfer system taught by Miyamori is quite different than that recited in claims 4 and 8. The invention recited in claim 4 simply *logically combines* a delayed signal *and* a non-delayed signal to obtain the output signal, and thereby reduces the effects of fading as expressly taught in the Specification. *See* the Specification at page 13, lines 12-20. In contrast, the light transfer system taught by Miyamori evaluates the level of an error correction signal to determine whether to *select* the first data signal *or* the second data signal as the output — the first and second data signal are not logically combined as in the claimed invention.

The shortcomings of Miyamori with respect to claims 4 and 8 are not remedied by the teachings of Bozzay. Bozzay is conspicuously silent on the issue of combining a delayed signal and a non-delayed signal to obtain an output signal. Consequently, Miyamori and Bozzay alone or in combination do not teach each and every feature of claims 4 and 8, and therefore do not support a *prima facie* case of obviousness as to claims 4 and 8. Accordingly, Applicant respectfully requests that the Examiner's rejection of claims 4 and 8 be reconsidered and withdrawn.

The Examiner has rejected claim 10 under 35 U.S.C. § 103(a) as being unpatentable over Miyamori in view of Bozzay, and further in view of U.S. Patent No. 6,122,084 to Britz ("Britz") and U.S. Patent No. 6,137,609 to Scheps ("Scheps"). Based on the following remarks, Applicant respectfully traverses.

As currently amended, claim 10 recites the system of claim 9, also including a receiver that receives the single output beam after it is transmitted through the Earth's atmosphere, wherein the receiver includes:

- at least one optical-signal-separating device that separates the single output beam, based on at least one of wavelength and polarization, into a second set of temporally distinguishable optical signals,
- a set of detectors, each detector configured to receive a respective optical signal from the second set of temporally distinguishable optical signals and convert the respective optical signal into a received data signal, thereby producing a received-set of temporally distinguishable data signals,
- at least one receiver-data-delay device that temporally aligns the received-set of temporally distinguishable data signals, thereby producing a final set of data signals, and
- a logic gate that receives the final set of data signals, and that logically combines (i) each successive bit in a first data signal in the final set of data signals and (ii) a corresponding successive bit in a second data signal in the final set of data signals, to obtain each successive bit of an output data signal.

Miyamori, Bozzay, Britz and Scheps alone or in combination do not teach or suggest each and every feature of claim 10. For example, Miyamori, Bozzay, Britz and Scheps alone or in combination do not teach or suggest “a logic gate . . . that logically combines (i) each successive bit in a first data signal in the final set of data signals and (ii) a corresponding successive bit in a second data signal in the final set of data signals, to obtain each successive bit of an output data signal,” as recited in claim 10. For at least the same reasons as set forth above with respect to claims 4 and 8, Miyamori and Bozzay do not teach a logic gate that performs the functionality recited in claim 10. In addition, Britz and Scheps are each conspicuously silent on the issue of combining two signals to obtain an output signal as recited in claim 10. Because Miyamori, Bozzay, Britz and Scheps alone or in combination do not teach each and every feature of claim 10, these references do not support a *prima facie* case of obviousness as to claim 10. Accordingly, Applicant respectfully requests that the Examiner’s rejection of claim 10 be reconsidered and withdrawn.

New Claims

New claims 14-16 depend from claim 9 and therefore contain each and every feature of claim 9. Accordingly, new claims 14-16 are not obvious in view of the applied references for at least the same reasons as set forth above with respect to claim 9.

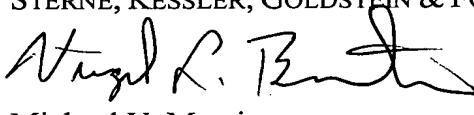
Conclusion

All of the stated grounds of objection and rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider all currently outstanding objections and rejections and that they be withdrawn. Applicant believes that a full and complete reply has been made to the outstanding Office Action and, as such, the present application is in condition for allowance. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

Prompt and favorable consideration of this Reply is respectfully requested.

Respectfully submitted,

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